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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,327	03/24/2004	Takashi Ando	042271	4003

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EXAMINER	
LEWIS, MONICA	

ART UNIT	PAPER NUMBER
2822	

MAIL DATE	DELIVERY MODE
05/29/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/807,327	ANDO, TAKASHI	
	Examiner	Art Unit	
	Monica Lewis	2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,4,6,8,10,12,13,15,16 and 18-30* is/are pending in the application.

4a) Of the above claim(s) *13,15,16 and 18-30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2,4,6,8,10 and 12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 March 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the request for continued examination filed March 14, 2007.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/14/07 has been entered.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claim 2 is rejected under 35 U.S.C. 102(a) as being anticipated by Applicant's Prior Art.

In regards to claim 2, Applicant's Prior Art discloses the following:

a) a semiconductor substrate (1) (For Example: See Figure 11);

b) a plurality of transistors formed on a surface of said semiconductor substrate (For Example: See Figure 11);

c) an interlayer insulating film (8) for covering said transistors (For Example: See Figure 11);

d) a plurality of ferroelectric capacitors (15) formed over said interlayer insulating film, an electrode of each of said plurality of ferroelectric capacitors being connected to one of a source or a drain (6) of said transistors via a first contact plug (9),wherein said plurality of ferroelectric capacitors are arranged in an array extending in longitudinal and lateral directions, (For Example: See Figure 11);

e) a plurality of bit lines (11) formed over said interlayer insulating film, each of said plurality of bit lines being connected to other of the source or the drain of said transistors via a second contact plug (10) (For Example: See Figure 11); and

f) the second contact plug is substantially located in a center area surrounded by four closest ferroelectric capacitors out of said plurality of ferroelectric capacitors (For Example: See Figure 10).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Prior Art.

In regards to claim 4, Applicant's Prior Art fails to disclose the following:

a) a straight line connecting the source and the drain of said transistors extends in a direction substantially inclined at an angle of 45 degrees to longitudinal and lateral directions of the arrays constituted by the plurality of ferroelectric capacitors.

However, the Applicant has not established the critical nature of "a straight line connecting the source and the drain of said transistor extends in a direction substantially inclined at an angle of 45 degrees to longitudinal and lateral directions of the arrays constituted by the plurality of ferroelectric capacitors." "The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within

the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range." *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir.1990). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have various ranges.

7. Claims 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Prior Art in view of Summerfelt et al. (U.S. Publication No. 2005/0012125).

In regards to claim 6, Applicant's Prior Art fails to disclose the following:

a) an element isolation insulating film formed on the surface of said semiconductor device and isolating a plurality of element regions, wherein each element region includes two transistors out of said plurality of transistors, and wherein a first straight line connecting a first source and a first drain of one of said two transistors substantially coincides with the second straight line connecting a second source and a second drain of second one of said two transistors.

However, Summerfelt discloses a semiconductor device that has an element isolation insulating film (8) formed on the surface of said semiconductor device and isolating a plurality of element regions, wherein each element region includes two transistors out of said plurality of transistors, and wherein the line connecting the source and the drain of one of said two transistors substantially coincides with the line connecting the source and the drain of the other one of said two transistor (For Example: See Figure 1A). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor of Applicant's Prior Art to include a semiconductor device that has an element isolation insulating film formed on the surface of said semiconductor device and isolating a plurality of element regions, wherein each element region includes two transistors out of said plurality of transistors, and wherein the line connecting the source and the drain of one of said two

transistors is substantially coincides with the line connecting the source and the drain of the other one of said two transistor as disclosed in Summerfelt because it aids in separating the transistors source/drains (For Example: See Paragraph 29).

Additionally, since Applicant's Prior Art and Summerfelt are both from the same field of endeavor, the purpose disclosed by Summerfelt would have been recognized in the pertinent art of Applicant's Prior Art.

In regards to claim 10, Applicant's Prior Art fails to disclose the following:

a) the other of the source or the drain of said transistors is shared by said two transistors in each element region.

However, Summerfelt discloses a semiconductor device that has the other one of the source or the drain of said transistor is shared by said two transistors in each element region (For Example: See Figure 1A). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor of Applicant's Prior Art to include a semiconductor device that has the other one of the source or the drain of said transistor is shared by said two transistors in each element region as disclosed in Summerfelt because it aids in reducing the capacitance (For Example: See Paragraphs 7 and 8).

Additionally, since Applicant's Prior Art and Summerfelt are both from the same field of endeavor, the purpose disclosed by Summerfelt would have been recognized in the pertinent art of Applicant's Prior Art.

8. Claims 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Prior Art in view of Summerfelt et al. (U.S. Publication No. 2005/0012125) and Corvasce et al. (U.S. Patent No. 6,656,801).

In regards to claim 8, Applicant's Prior Art fails to disclose the following:

a) an element isolation insulating film formed on the surface of said semiconductor device and isolating a plurality of element regions, wherein each element region includes two transistors out of said plurality of transistors.

However, Summerfelt discloses a semiconductor device that has an element isolation insulating film (8) formed on the surface of said semiconductor device and isolating a plurality of element regions, wherein each element region includes two transistors out of said plurality of transistors (For Example: See Figure 1A). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor of Applicant's Prior Art to include a semiconductor device that has an element isolation insulating film formed on the surface of said semiconductor device and isolating a plurality of element regions, wherein each element region includes two transistors out of said plurality of transistors as disclosed in Summerfelt because it aids in separating the transistors source/drains (For Example: See Paragraph 29).

Additionally, since Applicant's Prior Art and Summerfelt are both from the same field of endeavor, the purpose disclosed by Summerfelt would have been recognized in the pertinent art of Applicant's Prior Art.

b) a first straight line connecting a first source and a first drain of one of said two transistors is substantially orthogonal to a second line connecting a second source and a second drain of the other one of said two transistor.

However, Corvasce discloses a semiconductor device that has the line connecting the source and the drain of one of said two transistor is substantially orthogonal to the line connecting the source and the drain of the other one of said two transistor (For Example: See Figure 4). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor of Applicant's Prior Art to include a semiconductor device that has the line connecting the source and the drain of one of said two transistor is substantially orthogonal to the line connecting the source and the drain of the other one of said two transistor as disclosed in Corvasce because it aids in providing minimal cell size (For Example: See Abstract).

Additionally, since Applicant's Prior Art and Corvasce are both from the same field of endeavor, the purpose disclosed by Corvasce would have been recognized in the pertinent art of Applicant's Prior Art.

In regards to claim 12, Applicant's Prior Art fails to disclose the following:

a) the other one of the source or the drain of said transistors is shared by said two transistors in each element region.

However, Summerfelt discloses a semiconductor device that has the other one of the source or the drain of said transistor is shared by said two transistors in each element region (For Example: See Figure 1A). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor of Applicant's Prior Art to include a semiconductor device that has the other one of the source or the drain of said transistor is shared by said two transistors in each element region as disclosed in Summerfelt because it aids in reducing the capacitance (For Example: See Paragraphs 7 and 8).

Additionally, since Applicant's Prior Art and Summerfelt are both from the same field of endeavor, the purpose disclosed by Summerfelt would have been recognized in the pertinent art of Applicant's Prior Art.

Response to Arguments

9. Applicant's arguments filed 3/9/07 have been fully considered but they are not persuasive. Applicant argues that Applicant's Prior Art discloses that "second contact plug 60 is not substantially located in a center of an area surrounded by four closest ferroelectric capacitors...Applicant's Prior Art does not disclose wherein the second contact plug is substantially located in a center of an area surrounded by four closest ferroelectric capacitors out of said plurality of ferroelectric capacitors...in Explanatory Fig. A...center Co of the enclosed area corresponds to a center of an area in claim 2...in Explanatory Figure B...the center C1 of the enclosed area corresponds to a center of an area in claim 2...there is a clear difference between the present invention as recited in claim 2 and the structure shown in Fig. 10." Although, Applicant has disclosed explanatory figures, the Examiner is permitted to give a claim the broadest reasonable interpretation. Merriam-Webster defines center as a middle part. Therefore, Applicant's Prior Art does disclose that the second contact plug (60) is substantially located in a center area surrounded by four closest ferroelectric capacitors (65) out of said plurality of ferroelectric capacitors (For Example: See Figure 10-Marked Up Copy-Sent 7/6/06). Finally, the marked up copy clearly identifies the following: a) what the Examiner is considering the center area; and b) the four capacitors because they are labeled 1-4.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 571-272-1838. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300 for regular and after final communications.

ML

May 15, 2007

MONICA LEWIS
PRIMARY PATENT EXAMINER